MACROINVERTEBRATE STUDIES

SEA. 2007

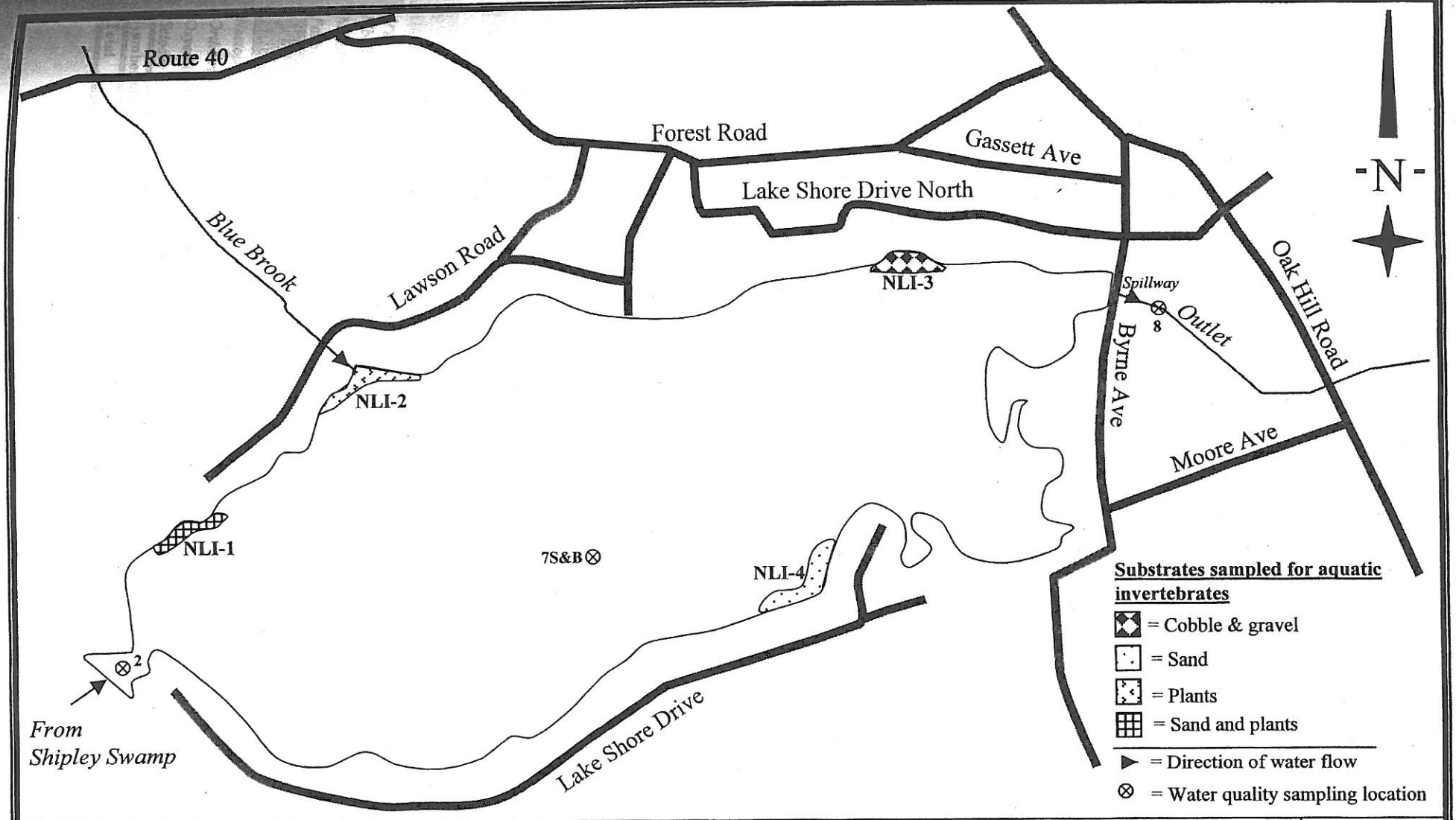
Lake Nabnasset Nuisance Aquatic Vegetation Management Program

NAB INVERTEBRATES- 2002

Table 1. Invertebrate Species Documented at Locations Within Nabnasset Lake by ESS During September 2002.

		Number of Individuals per Taxon			
Taxa	**Common Name**	**Site 1**	**Site 2**	**Site 3**	**Site 4**
Amphipoda (Scuds)					
Hyalella sp.	Scud	2	6	8	
Bivalvia (Mussels)					
Eliptio complanata	Eastern Elliptio Mussel	1	1	4	
Pyganodon cataracta	Eastern Floater Mussel	1			
Sphaerium sp.	Fingernail Clam	5	1	1	8
Coleoptera (Beetles)					
Dubiraphia sp. (larvae)	Riffle Beetle	2	2	3	33
Dubiraphia sp. (adult)	Riffle Beetle			1	3
Haliplus sp. (adult)	Crawling Water Beetle		3		
Microcylloepus sp.(larvae)	Riffle Beetle			10	
Stenelmis sp.(larvae)	Riffle Beetle			7	
Diptera (True Flies)					
Chironomidae	Midge (Larvae)	3	9	1	
Ephemeroptera (Mayflies)					
Baetis sp.	Bluewinged Olive		2	2	
Caenis sp.		4	4	7	
Stenonema sp.	Grey/Red Fox			4	
Gastropoda (Snails)					
Amnicola limosa	Mud Snail	2	23	7	9
Gyraulus parvus	Ash Gyro	6	3	1	
Gyraulus circumstriatus	Disc Gyro	1	1		
Viviparus georgianus	Banded Mysterysnail	1			
Hirudinea (Leeches)					
Helobdella fusca	Brown Snail Leech	1			
Gloiobdella elongata		1			
Isopoda (Pill Bugs)					
Caecidotea sp.		1	1	1	
Megaloptera					
Sialis sp.	Alderfly			2	1
Nematoda (Worms)	Roundworms	5		1	2
Odonata (Dragonflies)					
Argia sp.			1		
Libellulidae	Common Skimmers	1			
Nehalennia sp.	Sprite	5	2		
Pachydiplax sp.	Blue Dasher			1	
Oligochaeta (Segmented worms)		21	3	34	13
Trichoptera (Caddisflies)					
Nectopsyche sp.	White Miller		1		
Orthotrichia sp.	Microcaddisfly			1	
Oxyethira sp.	Microcaddisfly	1	2	1	
Setodes sp.			3		
Number of Taxa		**19**	**18**	**20**	**7**
Total		**64**	**86**	**97**	**69**

2002



0 ft 615 ft

Approximate Scale

Water Quality and Invertebrate Sampling Locations
Nabnasset Lake
Westford, Massachusetts

FIGURE NO.
1

PROJECT NO.
W198-000

ESS

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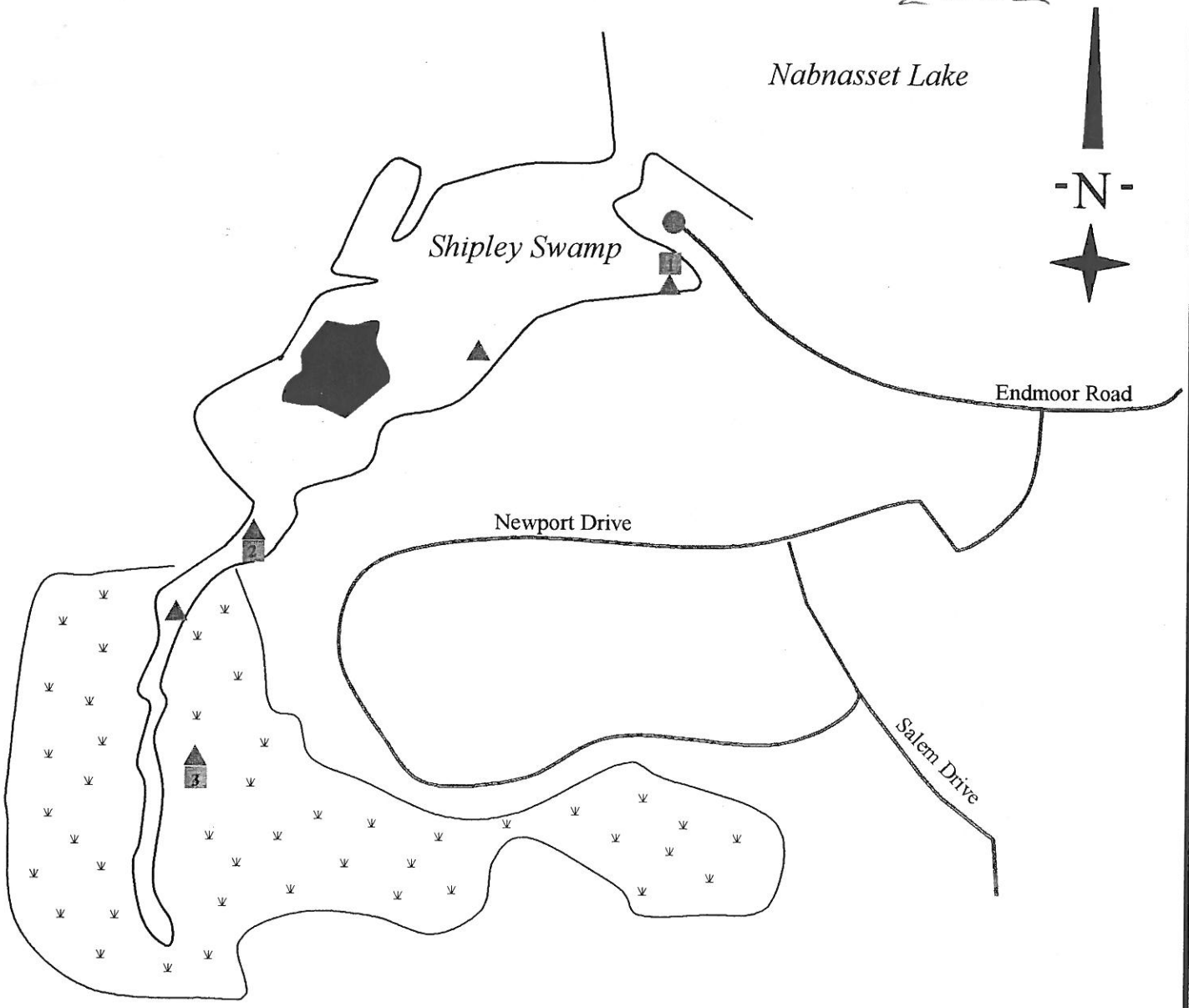
SHIPLEY- INVERTEBRATES - 2002

2002

Table 6 (cont.). Species historically documented in Shipley Swamp with Observations by ESS During 2002.

Common Name	Scientific Name	Historical documentation	Species observed by ESS, 2002
MAMMALS			
Beaver	*Castor canadensis*	2	*no*
Woodchuck	*Marmota monax*	1	*yes*
Muskrat	*Ondatra zibethica*	2	*no*
FISH			
Brown bullhead	*Ameiurus nebulosus*	1,3	*no*
Banded sunfish	*Enneacanthus obesus*	1,3	*no*
Chain pickerel	*Esox niger*	1	*no*
Catfish	*Ictallarus sp.*	3	*no*
Pumpkinseed sinfish	*Lepomis gibbosus*	1,3	*no*
Bluegill sunfish	*Lepomis macrochirus*	1,3	*no*
Largemouth bass	*Micropterus salmoides*	1	*no*
Golden shiner	*Notemigonus chrysoleucas*	1	*no*
Yellow perch	*Perca flavescens*	1,3	*no*
Black crappie	*Pomoxis nigromaculatus*	1	*no*
INVERTEBRATES			
Mites	Acari	-	*yes*
Snail	*Amincola sp.*	2	*no*
Freshwater mussels	*Anodonta cataracta*	2	*no*
Dragonfly (Larvae)	*Arigomphus villosipes*	2	*no*
Pill Bugs	Caecidotea	-	*yes*
True fly (Larvae)	Ceratopogonidae	-	*yes*
Midge (Larvae)	Chironomidae	2	*yes*
Damselfly (Larvae)	Coenagrionidae	2	*no*
Dragonfly (Larvae)	*Cordulegaster sp.*	2	*no*
Scuds	Crangonycitidae	-	*yes*
True fly (Larvae)	Culicidae	-	*yes*
Beetle (Larvae)	Dytiscidae	-	*yes*
Beetle (Adult)	Dytiscidae	-	*yes*
Freshwater mussels	*Elliptio complanata*	2	*no*
Beetle (Adult)	Elmidae	-	*yes*
Crawling water beetle	*Haliplus sp.*	2	*no*
Snail	*Helisoma sp.*	2	*yes- Family Planorbidae*
Water boatman	*Hesperocorixa sp.*	2	*yes- Family Corixidae*
Caddisflies	Hydroptilidae	-	*yes*
Springtails	Isotomidae	-	*yes*
Freshwater mussels	*Lampsilis radiata*	2	*no*
Caddisflies	Leptoceridae	-	*yes*
Damselfly (Larvae)	Lestidae	2	*yes*
Dragonfly (Larvae)	Libellulidae	2	*yes*
Beetle (Adult)	Noteridae	-	*yes*
Backswimmers	*Notonecta irrorata*	2	*no*
Backswimmers	*Notonecta lunata*	2	*no*
Backswimmers	*Notonecta undulata*	2	*no*
Moth (Larvae)	Nymphuliella sp.	-	*yes*
Worms	Oligochaeta	-	*yes*
Snail	*Promenetus dilatatus*	2	*yes- Family Planorbidae*
Snail	*Pseudosuccinea columella*	2	*yes- Family Lymnaeidae*
Water scorpion	*Ranatra cf. fusca*	2	*no*
Marsh Beetle (Larvae)	Scirtidae	-	*yes*
Water boatman	*Sigara sp.*	2	*yes- Family Corixidae*
Gnat	Simulidae	-	*no*
Fingernail clams	Sphaeriidae	2	*yes*
True fly (Larvae)	Tabanidae	-	*yes*
Scuds	Talitridae	-	*yes*
Snail	*Viviparus georgianus*	2,3	*no*

2002



Legend

- 4m² Vegetation Monitoring Plots
- Macroinvertebrate Sampling Locations
- Wetland Areas
- Island

1" = 1,000 Ft

Approximate Scale

Vegetation Monitoring Plots and Macroinvertebrate Sampling Locations

Shipley Swamp, Westford MA

FIGURE NO.
5

PROJECT NO.
W196-000

ESS

J:\Nabnasset\Swamp bathymetry

SHIPLEY INVERTEBRATES 2004

Table 3. Total number of macroinvertebrates collected from a 3-minute collection period within each of plot, August 3rd, 2004.

Taxa and Species	Plot A	Plot B	Plot C
Acanthinula		3	
Bivalvia (Pelecypoda)			
Pisidiidae (Sphaeriidae)	16		
Crustacea			
Amphipoda			
Hyalella Sp.	192	8	
Isopoda			
Caecidotea Sp.	12		
Gastropoda			
Lymnaeidae	2	7	
Physidae	32	3	
Planorbidae			
Menetus dilatatus	60		
Valvatidae			
Valvata sp.	4		
Hirudinea			
Rhynchobdellida			
Helobdella stagnalis	4		
Insecta			
Coleoptera			
Curculionidae (Adult)		1	
Dytiscidae (Larvae)	4		
Hydrophilidae (Adult)	2		
Diptera			
Ceratopogonidae		1	
Chironomidae (Larvae)	592	81	38
Ephemeroptera			
Baetidae	8	7	
Caenis sp.	12	5	
Hemiptera			
Corixidae	2	1	
Mesovelia sp.		2	
Pelocoris sp.		1	
Odonata			
Ladona sp.	6		
Nehalennia sp.	12	1	2
Trichoptera			
Hydropsyche sp.		2	
Oxyethira sp.	70	2	
Polycentropus sp.	10		
Triaenodes sp.	6	2	2
Oligochaeta	98	3	6
Total number per 3 min collection	**1158**	**130**	**48**

MUSSEL STUDY 2004

Table 1. Number of live mussels and dead mussels (including shells) by paired survey plot, Nabnasset Lake and Shipley Swamp, March 25, 2004. Samples were generally spaced equidistant between 56 Lakeshore North and the outlet of Shipley Swamp.

Location	Area Exposed to Drawdown		Area Not Exposed to Drawdown	
	Alive	Dead	Alive	Dead
Site 1 - 56 Lakeshore North	0	9	4	5
Site 2	1	7	6	4
Site 3	0	3	4	4
Site 4	0	1	7	2
Site 5	0	0	1	0
Site 6	1	1	4	2
Site 7	1	6	0	3
Site 8 - Outlet of Shipley Swamp	0	3	2	1
Totals	**3**	**30**	**28**	**21**
Average Density (no./ft^2)	**0.38**	**3.75**	**3.50**	**2.63**

In the area not exposed to drawdown, the mussel population was found to have between 0 and 7 live mussels/ft^2 with an average density of 3.50 live mussels/ft^2. The dead mussels, or mussel shells, obtained from this area was similar or slightly lower, with between 0 and 5 dead mussels/ft^2 and an average density of 2.63 dead mussels/ft^2. The total mussel count and density of both living and dead mussels in the areas not exposed to drawdown was 49 and 6.13, respectively.

In the plots surveyed that had been exposed to the drawdown, the mussel population was found to have between 0 and 1 live mussels/ft^2 with an average density of 0.38 live mussels/ft^2. The dead mussels, or mussel shells obtained from this area was substantially higher, with between 0 and 9 dead mussels/ft^2 and an average density of 3.75 dead mussels/ft^2. The total mussel count and density of both living and dead mussels in the areas exposed to drawdown was 33 and 4.13, respectively.

Since total mussel density (living and dead) was greater in the deeper waters that were not exposed to drawdown (6.13 mussels/ft^2) compared with the total density documented in shallower waters (4.13 mussels/ft^2), it is reasonable to conclude that either the mussel population was lower in the shallower waters to begin with, or, more likely, that many mussels were able to successfully migrate to deeper areas as the water receded. This observation is supported by the fact that the number of dead mussels in the shallower areas was only slightly greater than the number of dead mussels in the deeper waters (3.75 mussels/ft^2 vs. 2.63 mussels/ft^2). In addition, photo documentation of mussel migration was made during the period of drawdown that clearly shows evidence of this migration (Photo 1).